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Value Chain Analysis of Dairy Products in Esssera District Dawro Zone, Southern Ethiopia

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ABSTRACT
Dairy sector has significant contribution in supporting household income and used as source of food in Essera District of Dawro Zone in Southern Ethiopia. Producers, traders and supportive service providers play great role along dairy value chain in study area. But actors along the dairy value chain and their functions, the role of gender at producer level, benefit distribution along the dairy value chain and determinants of farmers participation decision and level of participation decision on milk value addition were not identified and analyzed to take intervention area to improve the dairy sector. This study aimed at assessing value chain of dairy products in Essera District with specific objectives of identifying actors and their roles, estimating benefit distribution along dairy products value chain, identifying the role of gender particularly women at farm level. The primary data for this study were collected from 133 producers, 24 traders and 12 consumers and analyzed using application of appropriate statistical tools. The result indicated that input suppliers, producers, local collectors, wholesalers and retailers are direct actors along dairy value chain in Essera District. Accordingly, producing and processing, collecting, packaging, storing and marketing dairy products are the major activities which were performed by the actors. Respondents' survey result asserts traders in study area faced with lack of training, lack of capital, lack of access to market and stiff competition of unlicensed traders respectively. The reason could be limited supply of credit and institutional weakness like license providing sectors. Average shares of profit margin of local collectors, wholesalers and retailers were 17.6%, 21.9% and 7.2%, respectively, from the sales of one kilogram butter. This asserts that wholesalers benefit more than other actors. Therefore, policy aiming at improving producers' and traders' access to improved inputs such as improved breed of dairy cows, credit, extension service and empower women to enhance dairy value chain in study area is crucial. In addition, value addition through both innovation and coordination should be done.
Keywords: Value addition, Essera, value chain analysis, margin, gender

1. INTRODUCTION

1.1. Background of the Study

Agriculture is the mainstay of the Ethiopian economy contributing about 85 percent of the population's livelihoods, provides 46 percent of Gross Domestic Product (GDP), and 80 percent of export revenue (Sintayehu *et al*., 2010). Ethiopia holds the largest livestock population in Africa which is estimated at about 52.13 million cattle, 24.2 million sheep and 22.6 million goats (CSA, 2012). Livestock plays an important role in Ethiopian agriculture. Thus, livestock contributes a significant amount to export earnings in the formal market (10 percent of all formal export earnings, or US$ 150 million per annum) and the informal market (perhaps US$ 300 million per annum). Moreover, livestock accounts for 15 to 17 percent of total GDP, and 35 to 49 percent of agricultural GDP. At the household level, livestock contributes to the livelihood of approximately 70 percent of Ethiopians (Sintayehu *et al.,* 2010).

Dairying is one of the investment areas farmers can venture into to improve their standards of living (ILRI, 2007). It is a developmental tool as it widens and sustains three major mechanisms out of poverty; securing the assets, improving smallholder and pastoral productivity, and increasing market participation by the poor (Randolph *et al.*, 2007). It is estimated that almost 150 million farm households (more than 750 million people), are engaged in milk production worldwide, the majority of who are in developing countries (FAO, 2010). The dairy sector provides income and employment to many, often poor, people. It is estimated that 12 to 14 percent of the world population, or 750-900 million people, live on dairy farms or within dairy farming households and the production of one million liters of milk per year on smallholder dairy farms creates approximately 200 on-farm jobs (FAO, 2010).

Dairy production is practiced almost all over Ethiopia (pastoralists, agro pastoralists and crop livestock farmers) involving a vast number of small scale, medium scale and large scale farms. Based on climate, landholdings and integration with crop production, dairy production systems are classified as small scale rural; per-urban and urban (Dereje *et al*., 2005). Small scale rural dairy production system is the dominant dairy production system practiced in the country. Based on market oriented production, scale and production intensity. Based on above criteria, three major production systems are, traditional smallholders, privatized state farms, and

urban and per urban systems (Gebre *et al.,* 2000).The smallholder dairy production system is not market-oriented and most of the milk produced is retained for home consumption. Milk production in this system is characterized by low yield and seasonal availability (Zegeye, 2003). In case of privatized state dairy production system producer raise animals primarily to produce milk, and provide feed, other inputs and management to generate their income and profits from the milk. They regard their milk production as an important business, rather than as a sideline activity (Felleke *et al*., 2010). Whereas urban and per urban dairy production sector controls most of the country's improved dairy stock and now expanding in the highlands among mixed crop– livestock farmers, such as those found in Selale and Holetta, and serves as the major milk supplier to the urban market (Gebre *et al*., 2000).

About 83% of the total milk production in Ethiopia is from cows and the remainder is from goats and camels in certain regions particularly in pastoralist areas (LDMPS, 2007). As dairying plays significant role in the lives of the urban and per-urban poor households (Yitaye *et al*., 2007), promotion of the dairy sector in Ethiopia can therefore contribute significantly to poverty alleviation as well as availability of food and income generation. In Ethiopia, dairy value chain entailed about 500,000 smallholder rural farmers who produce about 1,130 million liters of milk of which 370 million liters of raw milk, 280 million liters of butter and cheese and 165 million liters is consumed by the calves (Mohammed, 2009).The private sector to the increased demand for dairy is expected to be significant, the small-scale household farms in the highlands hold most of the potential for dairy development (Mohammed *et al*., 2004).

Value chain analysis can play a key role in identifying the distribution of benefits of actors in the chain. That is, through the analysis of margins and profits within the chain, one can determine who benefits from participation in the chain and which actors could benefit from increased support or organization. This is particularly important in the context of developing countries (and agriculture in particular), given concerns that the poor in particular are vulnerable to the process of globalization (Kaplinsky and Morris, 2001).

Value chain is an innovation that enhances or improves an existing product or introduces new products or new product uses (Fleming, 2005). The emerging trend for processed agricultural products in the global market creates opportunities for smallholder farmers in the developing countries to benefit from such opportunities by linking their activities to value chains through vertical and horizontal linkages (Vermeulen *et al*., 2008). The major ones include: actors along the chain and their functions and linkages among themselves, governance mechanisms for the chain and roles of actors e.g. power relations and principal drivers of the chain functions, impact of upgrading products, services and processes within the chain and distribution of benefits among actors within the chain (Kaplinsky, 2000; Kaplinsky and Morris, 2001; Rich *et al*. (2008). Jabbar (2009) stated that the analysis of a value chain encompasses wider issues than supply chain, which only shows the physical flow of goods or services from production to consumption through intermediate stages of value addition.

Ethiopia has a complex dairy value chain, with both formal and informal channels. Only 5% of the milk produced in Ethiopia is sold in commercial markets (LMD, 2012). In Ethiopia, fresh milk sales by smallholder producers are important only when they are close to formal milk marketing facilities, such as government enterprise or milk groups. Producers far from formal marketing outlets prefer to produce other dairy products instead, such as cooking butter and cottage cheese. The vast majority of milk produced outside urban centers in Ethiopia is processed into dairy products by the households, and sold to traders or other households in local markets (Muriuki *et al*., 2001).

The SNNPR has 23.5% of Ethiopia's milking cows and produces 27 of the percentage share of Milk Production. The processing and trade of dairy products, especially soured butter, dominates the dairy sector. Some of the butter is used for home consumption, and the surplus is for sale to small traders who transport it to urban areas for distribution by wholesalers and retailer butter traders. Ayib, a soft cottage cheese, is produced on the farm from sour buttermilk, for home use and for sale (LMD, 2013).

Dawro zone is one of SNNPR with the livestock resource of 411.54 thousand cattle, 168.02 thousand sheep's 125.08 thousand goats, 39.08 thousand equines and 219.87 thousand poultry. Essera District is the areas in which the research will be done with livestock species of 71460 cattle, 34857 shoat, 4508 equines and 40,081 poultry. Dairy sector has significant contribution in supporting household income and used as source of food in Essera District. The most known dairy products are butter, cheese and raw milk. Therefore, this study was focused on assessing dairy value chain in study area. Dairy sector has crucial role in improving the livelihoods of farmers through family income, employment generation, achieving food security, poverty alleviation as well as to improve nutritional status of the family in Essera District, Dawuro Zone, SNNPR. Demand of dairy products was high in study area because of presence of health centers, high school, increased population numbers and urbanization. Even if there is potential of dairy production, processing, marketing and consumption, there is insufficient information about actors and their functions; cost and benefit distribution along the chain and the role of gender in dairy value chain in farm level. Since there is no research conducted so far to address existing problems in study area, the motive behind this study was to provide information for intervention that would be useful to dairy farmers, dairy products traders, GO, NGOs, researchers and other stakeholders aiming at improving dairy value chains and has attempted to fulfill these gaps.

1.2. Objectives of the Study

1.2.1 General objectives of the study

The general objective of this study was to assess dairy value chain in Essera District Dawro Zone Southern Ethiopia.

1.2.2 Specific objectives of the study

- To identify actors and their functions along dairy value chain.
- To estimate the distribution of benefits of actors along the dairy value chain
- To identify the role of gender in dairy value chain at farm level

2 METHODOLOGY OF THE STUDY

2.1. Description of Study Areas

This study was conducted in Essera District of Dawuro Zone Southern Ethiopia. The Dawro Zone covers total area of 4436.7 sq.km^2 and lies between 6.59-7.34 degree north latitude and 36.68 to 37.52 degree east longitudes, with an elevation ranging 501-3000m. The Zone has a five Districts and one urban administration which are Mareka, Loma, Gena, Tocha and Essera. It has atotal population of 398,796. Regarding the Agro-Ecology, 55.6% is *Kolla*, 41.4% is *Weyna-Dega* and 3% is *Dega*. The average annual rainfall ranges from 1201 to 1800mm. According to the land utilization data of the region, 38.4% is cultivated land, 13.39% grazing land, 16.81% forest bushes and shrub land, 17.09 % cultivable and 14.31 is covered by others. The livestock resource of the Zone was estimated to be 313,094 cattle, 113,554 sheep, 45,703 goats, 7,081 horses, 1,934 mules, 5,064 donkey, and 157,996 chicken and 28,557 traditional hives (CSA, 2006).

Essera District is located at 522, 575 and 584 kms from Addis Ababa through Hosanna, Shashemene and Jimma roads respectively; and 350 kms from Hawassa, the regional capital. The area is topographically undulating and rugged. The district covers a total area of 1043.1 km^2 and lies between 6.7-7.02^0 latitude and 36.7 to 37.1^0 longitudes, with an elevation ranging from 501 to 2500 m.a.s.l. The District lies in three agro-ecological regions: *Kolla* region, which is within 500-1500 m.a.s.l; *Woyna-dega* within 1501-2500 m.a.s.l; and *Dega* at above 2500 m.a.s.l. The annual mean temperature varies from 17.6 to 27.5^{o}C. The rainfall is a bimodal type: the short rainy season is between February and March and the long between May and September. The average annual rainfall varies between 1401-1800 mm (EWARDO, 2008). According to the land use plan of the area, 38.4% is cultivated land, 13.39% grazing land 16.81% forest bushes and shrub land, 17.09% cultivable, and 14.31% is covered by others. The District has 29 *kebeles* (27 rural and 2 urban) with a total population of 82,218 (EWFEDO, 2014). Out of this 41,762 are male and 40,456 are female and total households in the District are 17021.

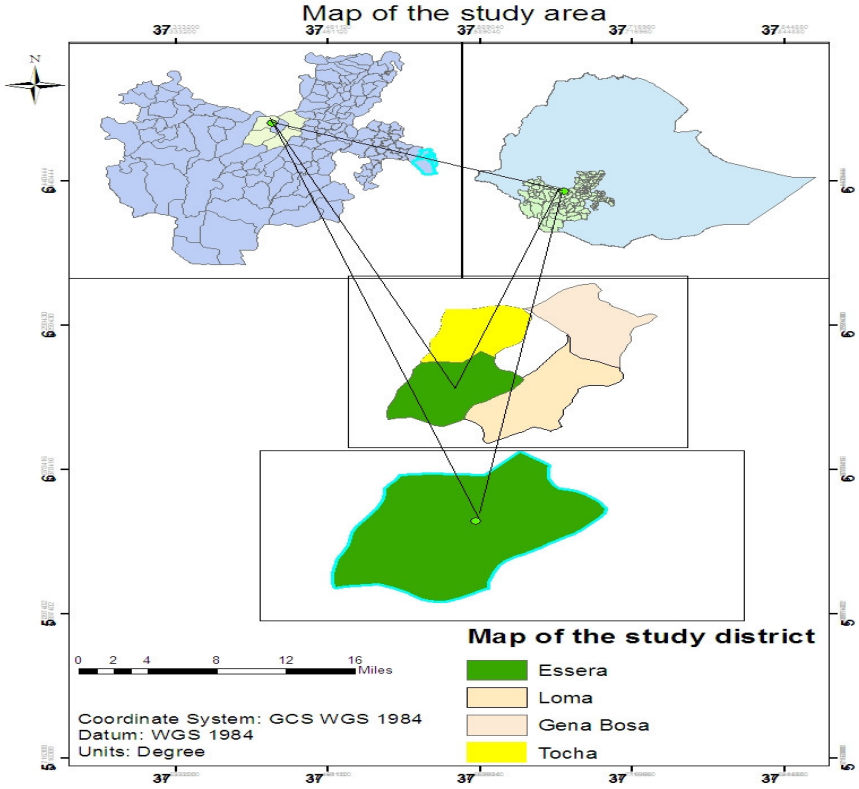

Figure 2: Map of Essera District in Dawuro Zone
Source: EWAO (2015)

2.2. Sampling Procedure and Sample Size Determination

A multi stage sampling technique was used to select representative sample for this study. Before selection of Kebeles and sample farm households, consultation with District agricultural experts and development agents was made. Dawro Zone has a total of five Districts and one urban administration. In first stage, Essera District was selected purposively based on the volume of dairy production and involvement of actors along dairy value chain. Second stage, 6 *Kebele* administrations were selected from 29 kebele administrations on the basis of dairy production and marketing potential. These are Bale, Gudumu, Duzi, Dalli, Arusibala and Ofa. The total number of dairy producers in each kebele administrations is 603, 568, 540, 504, 448 and 517 in Bale, Gudumu, Duzi, Dalli, Arusibala and Ofa, respectively. Finally, 133 sample households were selected randomly by applying probability proportional to size sampling technique. For populations that are large, Cochran (1963) developed the Equation (1) given below to yield a representative sample for proportions.

$$n_o = \frac{z^2 pq}{e^2} \quad \text{---------- (1)}$$

Where n_o is the sample size, z^2 is equals the desired confidence level at 95% which is 1.96, e is the desired level of precision, p is the estimated proportion of an attribute which indicate homogeneity of the study population that present in the dairy producers which is at 10% because of similar socio-economic factors. The value for Z is found in statistical tables which contain the area under the normal curve. Therefore, the sample size (n_o), was calculated as follows.

$$n_o = \frac{1.96^2 0.1(1-0.1)}{0.05^2} = 138$$

According to Cochran (1977) sample size readjustment formula was used if the population was less than 10,000 and the target population is finite. In this study the population was less than 10,000 which was 3,180 and target population is finite. Therefore, finite population correction formula was used and the sample size was reduced slightly. In addition to this, there was less variability in population (dairy producers); sample size adjustment formula was needed to determine small numbers of sample size because it provides proportionately more information for a small population than for a large population. Therefore, the sample size ($\boldsymbol{n_o}$) can be adjusted using equation 2 as follows.

$$n = \frac{n_o}{1+\left(\frac{n_{o-1)}}{N}\right.} \quad \text{---------- (2)}$$

Where n is the required sample size and N is the population size.

$$n = \frac{138}{1+\frac{(138-1)}{3180}} = 133$$

Table 1: Sample size determination for producers

Kebele	Total households	Dairy producer households	Proportion	Sample households
Duzi	778	540	0.17	28
Gudumu	792	568	0.18	29
Dalli	620	504	0.16	26
Ofa	628	517	0.16	26
Arusibala	548	448	0.14	24
Bale	1053	603	0.19	30
Total	4419	3180		133

Traders' survey

Traders' survey include intermediary dairy value chain actors involved along milk and milk products marketing such as wholesalers, assemblers, retailers and processors (producers). Selection of these actors were range from the study area to the major towns and marketing centers such as Bale town, Dali town, Waka and Tercha town in Dawuro Zone. These areas were selected purposively from the major towns and marketing centers based on different functions performed along dairy value chain by many actors so that probability proportional to size will be applied. The total number of traders is 156 with traders number in each of the selected towns is 64, 54, 19, and 19 in Balle, Dalli, Waka and Tercha, respectively. From each of the towns 10, 7, 3 and 4 traders from Balle, Dalli, Waka and Tercha was selected purposively based on their extent of market participation. Finally, a total of 24 traders were selected from the study areas. In addition to these, 12 consumers were selected randomly from the study areas.

Table 2: Traders sample size determination along dairy value chain

Traders	Balle		Dalli		Waka		Tercha		Total	Total
	N	n	N	n	N	n	N	N	N	N
Assemblers	10	2	12	2	5	1	6	1	33	**6**
Wholesalers	14	3	10	1	6	1	8	2	38	**7**
Retailers	40	5	32	4	8	1	5	1	85	**11**
Total	64	10	54	7	19	3	19	4	156	24

Note: % is proportion, n is sample size and N is population number of traders in study area. From each town traders were selected purposively.

2.3. Types, Sources and Method of Data Collection

Dairy value chain analysis was conducted through a combination of qualitative and quantitative methods. Thus, both quantitative and qualitative data were used to find out necessary results from this study. Quantitative data permit a more objective assessment and facilitate an assessment of larger-scale patterns, trends and relationships among different value chain actors. Questionnaires focused on what value chain actors are doing. The qualitative research tool was used to check the reliability of data collected by questionnaire. The secondary sources of data were journals, books, internets browsing, reports of national policy, regional, zonal and District. While primary data sources includes agricultural office, Marketing and cooperative office, trade and industry office, agriculture department, trade and industry department, key informants, Development Agents (DA), dairy producers, traders and consumers. Finally, participatory rapid appraisal tools were conducted.

Before data collection, discussion with the administrative bodies to get well-organized data from representative Kebeles administration that represents the District administration dairy value chain. This was done through group discussion. Based on structured questionnaire, short time training was given for the stakeholders who are necessary in order to give full data about dairy value chain for the investigation. Next group discussion interview and household interview was taken place on data related with actors along dairy value chain and their roles along the chain, factors affecting farmers' decision of milk value addition at farmers' level, benefit distribution along dairy value chain to identify who benefits more and the role of gender in dairy value chain at farm level was captured. Generally, well-developed structured questionnaire and checklists were prepared and socio-economic, demographic data were fulfilled by dairy households, traders and consumers by themselves and enumerators were assigned from DA.

2.4. Methods of Data Analysis

2.4.1. Descriptive statistics

Data collected through structured and semi-structured questionnaire survey was coded, entered, edited and analyzed by using both SPSS version16 and STATA. Descriptive statistics such as frequency, percentage, mean and standard deviation were used to analyze the survey data collected from smallholder dairy farmers, assemblers, wholesalers, processors, retailers and consumers. Inferential statistics such as hypothesis testing, Chi-Square test, t-test, pseudo R^2 and p-value were used to test statistical significance of regression parameters.

Value chain analysis

According to Kaplinsky and Morris (2001), value chain analysis approach was used to analysis the actors with their functions along dairy value chain. Value chain analysis approach depends on the research question. Accordingly, four aspects of value-chain analysis have been applied in agriculture. First, value chain analysis systematically maps the actors participating in the production, distribution, processing, marketing and consumption of a particular product. Second, through the analysis of margins and profits within the chain, one can determine who benefits from participation in the chain and which actors could benefit from increased support of organization. Third, examining the role of upgrading within the chain because of upgrading can involve improvements in quality and product design that enable producers to gain higher-value or through diversification in the product lines served. In addition, the structure of regulations, entry barriers, trade restrictions, and standards can further shape and influence the environment in which upgrading can take place. Possible forms of upgrading include: process upgrading, product upgrading and function upgrading. Finally, governance is important from a policy perspective by identifying the institutional arrangements that may need to be targeted to improve capabilities in the value-chain, remedy distributional distortions, and increase value-added in the sector.

Estimation of benefit distribution of actors in market chain

Marketing margin is the difference between retail price and farm price (Cramers and Jensen, 1982).Computing the total gross marketing margin (TGMM) is always related to the final price paid by the end buyer and is expressed as a percentage (Mendoza, 1991). According to Mendoza (1995), high marketing margin could sometimes refer little or no profit or loss for the particular actor in the chain because it depends on cost associated with marketing together with the buying and selling prices.

$$TGMM=\frac{Endbuyerprice-firstsellerpricen}{Endbuyerprice}\times 100 \text{---------- (3)}$$

Where, TGMM is total gross marketing margin. It is useful to introduce the idea of 'producer's participation', 'farmer's portion', or 'producer's gross margin (GMMP) which is the portion of the price paid by the consumer that goes to the producer.

The producer's margin is calculated as a difference:

$$GMMp=\frac{\text{End buyer price}-\text{marketing gross margin}}{\text{End buyer price}}\times 100 \text{---------- (4)}$$

Where, GMMp is the producer's share of consumer price

$$NMM = \frac{\text{Gross margin – marketing costs x } 100}{\text{End buyer price}}$$

Thus, the marketing margin in this study should be understood as gross marketing margin (Scott, 1995). Accordingly, in this specific study as it is difficult to obtain precise cash and imputed marketing cost for butter and milk marketing chains, marketing margin (even the calculated net marketing margin) should be understood as gross marketing margin. Profit margin or the value added to a product at each stage of the value chain is also calculated as the selling price minus the total production and marketing costs. The total cost for traders and private processors is the sum of marketing cost and buying price of the product. The proportion of value addition at each stage relative to the value added along the value chain is also calculated for each actor in the different channels (Marshall *et al*., 2006). Therefore, it was calculated as:

Value added = Revenue - Total cost---------- (5)

Where; Revenue =Sales volume * Unit price

Analysis of the role of gender in dairy value chain at producer level

Harvard Analytical Framework is a gender framework tool, which was used to analysis the role of gender and their constraints along dairy value chain. According to (Ochola *et al*., 2010), gender roles framework was developed by the Harvard Institute for International Development in collaboration with the Women in Development office of USAID, and was first described in 1984 by Catherine Overholt and others. The starting point for the framework was the assumption that it makes economic sense for development aid projects to allocate resources to women as well as men, which make development more efficient a position named the "efficiency approach". The Harvard Analytical Framework is a grid for collecting data at the community and household level. It is a useful way of organizing information and can be adapted to many situations. This gender analytical frame work has four Tools such as Harvard Tool 1(activity profile), Harvard Tool 2 (access and control over), Harvard Tool 3 (influencing factors profile) and Harvard Tool 4 checklists (USAID, 2008). It was used to identify all relevant productive and reproductive tasks and answers the question: who does what? Parameters like adult women, adult men, boys and girls; and activity locus (specifying where the activities are performed) were examined.

3. RESULTS AND DISCUSSION

This chapter presents that different actors and their function along dairy value chain, value chain mapping, value chain governance; costs, benefit distribution calculation along actors to realize who benefits more; the role of gender in dairy value chain at producer level and determinants of farmers' participation decision and level of milk value addition based on the survey result of producers, traders, service providers and consumers. Demographic and socio economic data of households were analyzed by descriptive statistics. Percentages, mean value and standard deviation were used to interpret the data analyzed through descriptive statistics. Costs and benefit distribution of actors along dairy value chain was estimated by marketing margin formula. Thirdly, the role of gender in dairy value chain at producer level analyzed by Harvard gender framework analytical tool with activity profile, access to resources and control over resources, influential profile and checklist profile were used. Thus, Chi2 test and T- test were used to interpret the survey results of households.

3.1 Value Chain Analysis

3.1.1 Value Chain Map of Dairy Products in Essera District

Value-chain analysis systematically maps the actors participating in the production, distribution, processing, marketing and consumption of a particular product. Value chain mapping is defined as drawing a visual representation of the chain, which involves various linkages among the dairy actors. According to McCormick and Schmitz (2002), value chain mapping enables to visualize the flow of the product from conception product design to end consumer through various actors. It also helps to identify the different actors involved in the dairy value chain and to understand their roles and linkages. The value chain map depicts the flow of dairy products in the market, activities carried out at each stage of the value chain, the structure of actors and the support involved in the value adding process. Hence direct actors along dairy value chain in Essera district are input suppliers, producers, local collectors, wholesalers in the district, wholesalers outside district and retailers. In addition to this,

governmental organization such as Agricultural Office, agricultural growth program, Marketing and Cooperative Office, Trade and Industry Office and Roads development Office are the major supportive service providers while Omo Micro Finance and UREUP are the major nongovernmental organizations which are providing service for the actors along dairy value chain. Therefore, the actors, their roles, the distribution of dairy products and the flow of information between the actors in Essera District was depicted in Figure 6 as follows

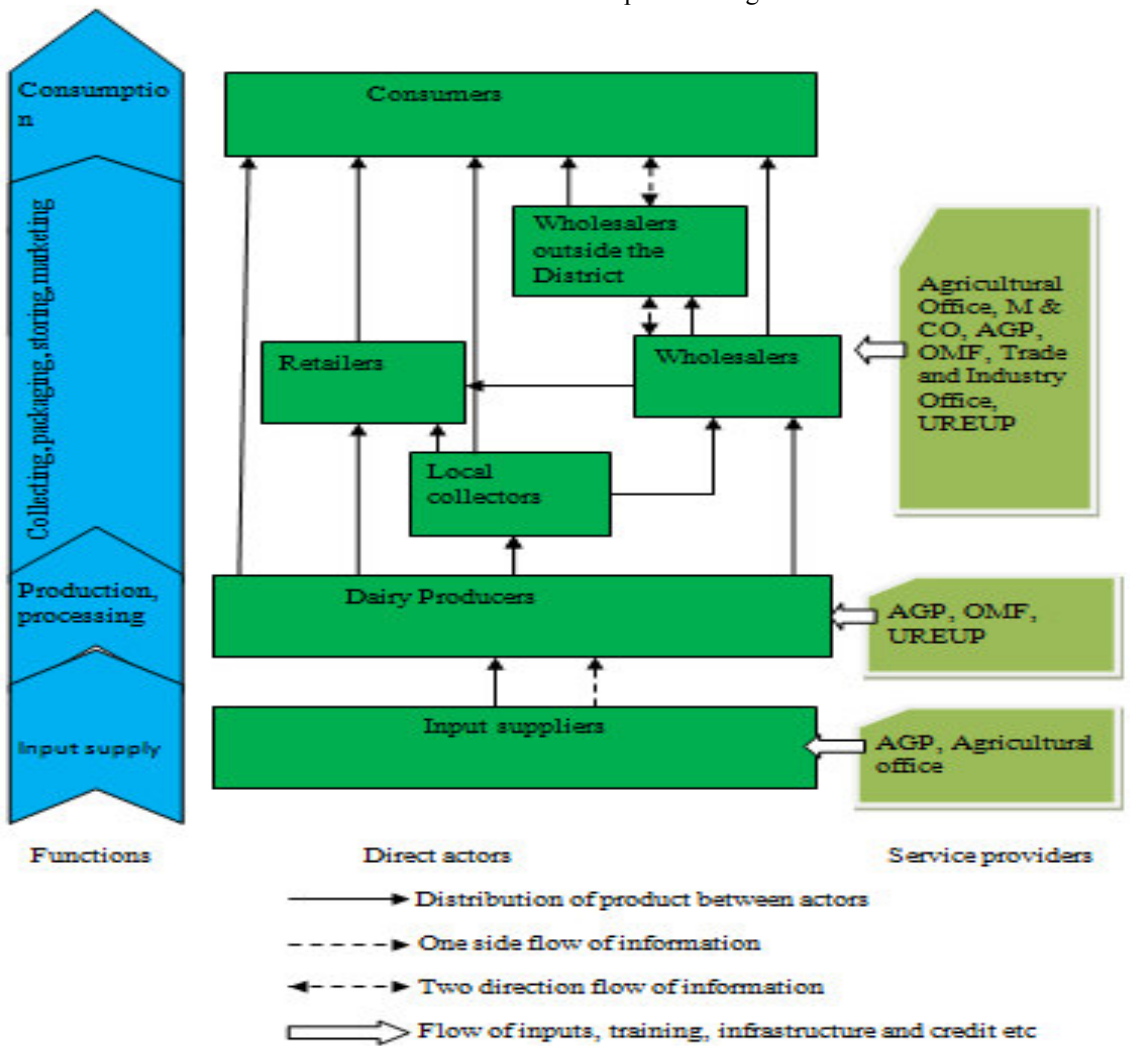

Figure 5: Dairy products value chain map in Essera District
Source: Own survey result (2015)

3.1.2. Dairy Value Chain Actors and Their Function in Study Area

The dairy livestock sub-sector is increasingly becoming an important sector in poverty reduction efforts and the improvement of households' incomes from sales of milk and milk products, employment creation and improving nutritional status of families in study area. This implies that milk and milk products were the major income generating and poverty alleviation tools for small holder dairy farmers. Traders are also direct actors and benefit from marketing of dairy products. In each step there were value addition to fetch good price and value addition was taken to extend shelf life of the product. According to Anandajayasekeram and Berhanu (2009), at each stage in the value chain, the product changes hands through chain actors, transaction costs are incurred, and generally some form of value is added.

3.1.2.1. Value chain actors

The primary actors in dairy value chain in Essera District were improved feed and improved dairy cows suppliers, producers, traders (local collectors, wholesalers and retailers); and consumers. Producers were producing dairy products as well as processors of milk in Essera District. Each of these actors adds value to milk and milk products. Some functions are performed by more than one actor along dairy value chain. The direct actors play crucial role along dairy value chain and their major activities were identified as follows.

Input suppliers: Dairy products value chain in the study area starts from the concept of design of products from production with use of inputs to consumers and distribution of value added milk products. Inputs which are

supplied by input suppliers in study area includes AI, improved dairy cows, improved feed and veterinary service in study area. Agricultural office and Agricultural Growth Program are the major input suppliers that play a great role in the study area to encourage milk value addition along dairy value chain.

Producers: Producers are the first most important direct actors along dairy value chain. Large proportion of dairy products are produced and processed from smallholder dairy farmers in study area. They have used both cross breed dairy cows and local breed for milk production. Farmers in study area use their own land and they have been using family labor for feeding, watering, barn cleaning, milking, processing and marketing their products. The survey result revealed that 88% of sampled households were producing local breed dairy cow and the remaining 12% were producing both cross and local breed dairy cows.

Dairy production in producers' level is dominated by smallholders with an average of 2 dairy cows per household in study areas. The maximum and minimum quantity of milk produced in study area is 5 and 1.25 liters/day/household respectively. The maximum and the minimum level of milk value addition in study area are 3.75 liters and 0 liter (who are not participating in milk value addition. On average 2.03 liters of milk produced per day and out of these 1.04 liters of milk processed to butter and cottage cheese in the study area. The remaining amount of milk consumed in the home in the form of liquid milk. Thus, the difference in quantity of milk produced and level of milk value addition in sampled household is due to breed of dairy cows, value addition experience and non dairy source of income.

Respondents of 54.1%, 21.8 and 24.1% revealed that milk value addition participation decision of producers' in study area affected by lack of credit, lack of value addition experience and both lack of credit with lack of value addition experience respectively. Producers feed their dairy cows in natural pasture land and there was shortage of improved feeds which weaken farmers' participation decision on milk value addition there by limit the volume of milk left for value addition.

Local collectors: dairy products are the main profitable income generating for traders in study area. Local collectors are collectors who are collecting dairy products specially butter in large proportion and cottage cheese in small proportion. They collect dairy products from the producers from local market (*Dalli, Balle, Duz, Gudumu and Ofa*) marketing centers and from the produce area of the producers. They purchase 1KG of butter and cheese by the average price of 105 ETB and 45 ETB respectively. After they have collected packaging, grading, storing and transporting to urban market in Essera District (*Bale, Dalli*); out of District (*Tocha, Waka, Tercha, Jimma, Wolayta*) sold on average price of 1KG butter/120 ETB and 1KG cheese/60 ETB for the wholesalers, retailers and consumers.

Wholesalers: The Wholesalers play important role in study area. They purchase dairy products from producers and local collectors. Different activities performed by wholesalers along dairy value chain in the study area. These are purchasing, packaging, storing, transporting and marketing. Most of the time wholesalers purchase butter from both producers either from local market center or urban market center of the District. They were distributed the produce to urban center of production area, Zonal market center, Out of Zone (*Chida, Jimma and Wolayta*). The market value of butter is different in quality of butter and different market centers. They were classify butter as *Yebesele, Mekakelegna* and *Lega* which was sold by on average price of 150, 135 and 120 ETB/kg respectively.

Retailers: They were actors play important role in study area. Their purchasing capacity was less than that of wholesalers and local collectors because of shortage of initial capital for business. They purchase dairy products from producers in large proportion in optimum price and local collectors, wholesalers in small proportion thereby sold to consumers, hotels and cafeterias by average price of 160 ETB.

Finally, consumers are the end users of dairy products. They consume dairy products either purchasing or producing. In dairy value chain from the design of production to the distribution of dairy products to consumers, it is important to carry out the demand of the products based on consumers' preference. This implies consumers are one of the most important customers of producers, wholesalers and retailers. But in study area the survey results out of 12 respondents of consumers, 66.7% of the respondents revealed that dairy products are not produced based on consumers preference. The reason is lack of skills of dairy value chain actors on quality standards there by hinder the distribution of dairy products. The finding of this result agreed with Kohl (2001) observed that consumer tastes and preferences will be a key factor driving food distribution systems in the 21st century.

Table 3: Actors and their main function along dairy value chain in study area

Actors	Functions performed by actors
Input Suppliers	• Improved dairy cows • Improved feed • AI, Veterinary Service • Credit service • Extension service
Producers	• Feeding • Watering • Vaccinating • Inseminating • Milking • Processing • Cleaning • Packaging • Marketing
Local collectors	• Purchasing dairy products • Packaging Grading Storing • Cleaning • Transporting and marketing
Wholesalers	• Purchasing dairy products • Packaging, Grading, Storing • Cleaning • Transporting and marketing
Retailers	• Purchasing dairy products • Packaging Grading Storing • Cleaning • Transporting and marketing
Consumers	Purchasing and consume

Source: Own survey result (2015)

3.1.2.2. Supportive service providers along dairy value chain in Essera District

Service provision is necessary for value chain actors to perform the activities that add value and reduce transaction cost. According to Martin *et al*. (2007) access to information, knowledge, technology and finance determines the state of success of value chain actors. Thus, there were different supportive service providers in study areas.

Extension service providers: In the study areas extension service providers are both GOs and NGOs. These are agricultural office, agricultural marketing and cooperative office, agricultural growth program, ACDI (Agricultural commodity development and improvement program). They provide training on dairy cows feeding, management, quality improvement of dairy products milk value addition, market information, AI, improved feed like elephant grass, alfalfa, cross breed dairy cows in common interest group and veterinary service.

Credit service providers: Omo micro finance play role in accessing credit for farmers in study area. Farmers' and traders in study area accessing credit from Omo micro finance and informal lenders like relatives. Banks are collateral based and accessing credit for dairy expansion was impossible in study area. This is in line with Embaye (2010) asserts farmers and dairy products traders could obtain credit from micro credit institutions, and informal lenders such as farmers and traders. However, the credit system was not well developed; the commercial banks are predominantly state owned as well as collateral based.

On other hand through small enterprise access to credit facilitated on the behalf of trade and industry office and women formed in a group to participate in dairy products marketing particularly butter. The main reason for most farmers not participating in credit was limited supply of credit, bureaucracy, unavailability of credit agents and high interest payment especially to take credit from Omo micro finance institution. The survey result of respondents (54.1%) revealed that dairy producers and dairy product traders have obligatory to save 20% of money in Omo microfinance before get credit from institute and pay back with the interest rate of 8%. Therefore, their participation on access to credit was limited and it is not affordable for the actors in study area.

License providers: Trade and Industry office and marketing and cooperative office play important role in providing license for the traders in study areas. Trade and Industry office was give the license of trading where as marketing and cooperative office was give license of presence of good storage space for dairy products, milk products storing equipment and etc which were taken as criteria to be fulfilled by traders to keep the quality of products.

3.1.3. Value Chain Governance along Dairy Value Chain in Essera District

Value chain governance indicates the power dynamics wielded by different kinds of actors along value chain. Governance ensures that interactions between actors along a value chain reflect organization. The governance of value chains emanate from the requirement to set product, process, and logistic standards, which then influence upstream or downstream chain actors and results in functions. But in study area small holder farmers have no access to market information and the price of their products governed by traders. Small holder dairy farmers have poor coordination among each other as well as they have poor coordination among traders thereby they provide less quality dairy products. Power asymmetry is central in value chain governance (Kaplinsky and Morris, 2001). But the coordination and interaction among the actors along dairy value chain is very poor in study area because of extension service gap. In the study areas there is also power asymmetry among the actors. It is governed by some power full actors without formal coordination among the actors. Generally, in study area the traders who have no license of trading dairy products govern the traders who have license.

3.2 Dairy Products Production and Marketing channels in Essera District

Most farmers keep only a few dairy cows in study area. Thus, milk production and dairy products are fluctuating with the season. Thus farmers processing milk because processed dairy products provide regular income, improve nutrition, selling processed milk products is more profitable than selling fresh milk, generates employment, improves quality and safety. Survey result revealed that smallholder farmers produce fresh milk and processed products such as butter and local cheese (*ayib*). Moreover, fresh milk is used for household consumption, and processed into butter and sold in near or far away markets. This result agreed with Zegeye (2003), asserts that butter dominates dairy marketing and the transaction in the form of raw milk is limited to the surroundings of major urban centers. Because of limited rural road net works, absence of milk collection centers and processing facilities the flow of liquid milk from surplus milk producing milk sheds to urban centers is impended in study area.

3.2.1. Butter Production Practice and its marketing channel in the Essera District

A marketing channel consists of individuals and firms involved in the process of making a product or service available for use or consumption by consumers or industrial users (Berkowitze, 2011). The analysis of marketing channels is intended to provide a systematic knowledge of the flow of goods and services from their origin (producer) to their final destination (Scott, 1995). According to the survey result, seven main alternative channels were identified for butter marketing in study area. It was estimated that on average 42,000 KG of butter were marketed in Bale, Duzi, Gudumu, Hageli, Ofa, and Dali markets in 2014/2015. On average 1453.5KG of butter are supplied by sample respondents. The main marketing channels identified from the point of production until the product reaches the final consumer through different intermediaries were depicted in Figure 6. As the result indicated in Figure 8 the main receivers from producers were local collectors, wholesalers inside District, wholesalers outside District, retailers, and consumers with an estimated percentage share of 8%, 12%, 12%, 20% and 60%, respectively. Based on volume that passed through each channel, the channel of producer – consumer carry on the largest followed by producer– consumer; and producer – rural retailers – producer –wholesalers that carry a volume of 872KG, 290.7KG and 136KG of butter respectively.

I. Producers ⟶ Consumers (872KG)
II. Producers ⟶ Retailers ⟶ Consumers (290.7KG)
III. Producers ⟶ Local collectors ⟶ Wholesalers ⟶ Consumers (13.95KG)
IV. Producers ⟶ Wholesalers ⟶ Retailers ⟶ Consumers (38.4KG)
V. Producers ⟶ Local collectors ⟶ Retailers ⟶ Consumers (50KG)
VI. Producers ⟶ Local collectors ⟶ Consumers (52.33KG)
VII. Producers ⟶ Wholesalers ⟶ Consumers (136KG)

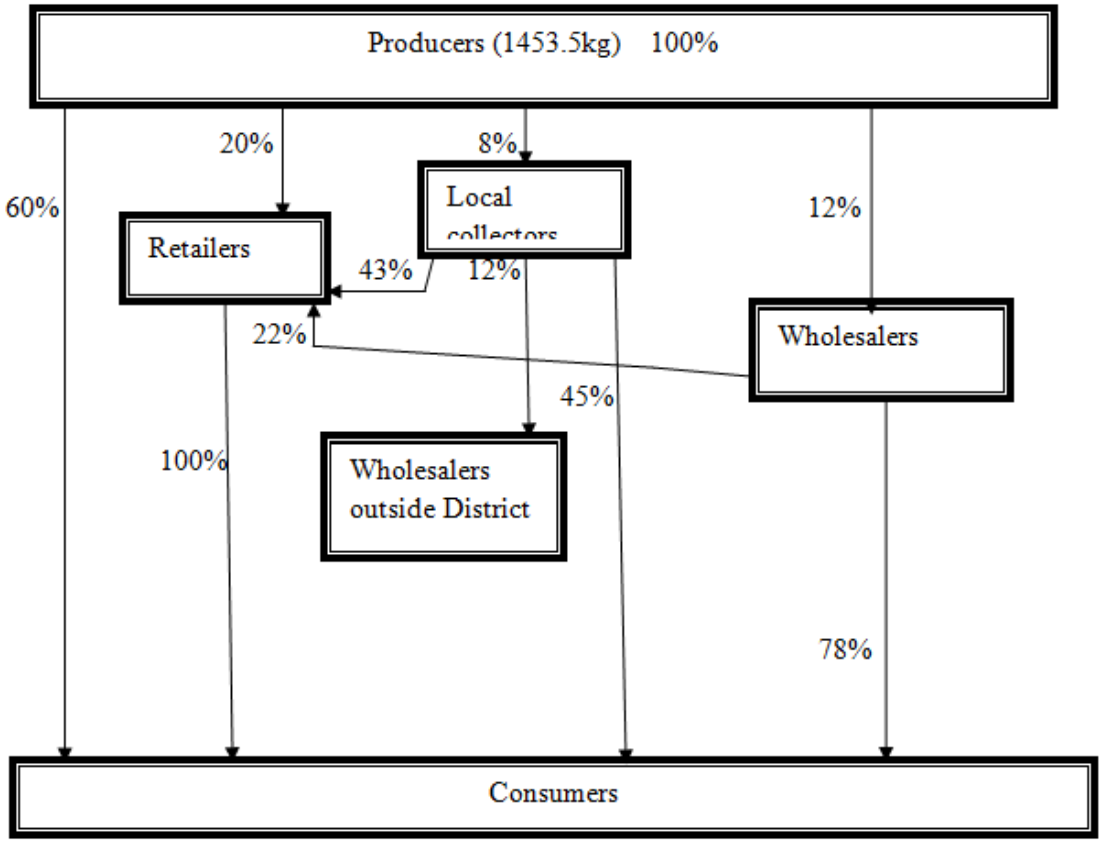

Figure 6: Marketing channel of butter
Source: Own sketch from survey result (2015)

3.2.2. Cottage cheese and its marketing channel in study area

It is one of the second important value added dairy product in Essera District. It has three marketing channels in study area. It has lacked long marketing channel outside the District because of its perishable nature there is shortage of storage facility in study area. In addition to butter production, on average 21,800 KG of cottage cheese were supplied to the same market center in study area in 2014/2015. Out of total quantity supplied, on average 950 kg of cottage cheese are supplied to market by sampled households. As the result indicated in figure 7, the large volume of cottage cheese were sold to consumers through producers-consumers, producers-local collectors-consumers and producers-retailers-consumers that carry the volume of 712.5KG, 142.5KG and 95KG respectively.

Producers ⟶ consumers (712.5KG)
Producers ⟶ local collectors ⟶ consumers (142.5KG)
Producers ⟶ retailers ⟶ consumers (95KG)

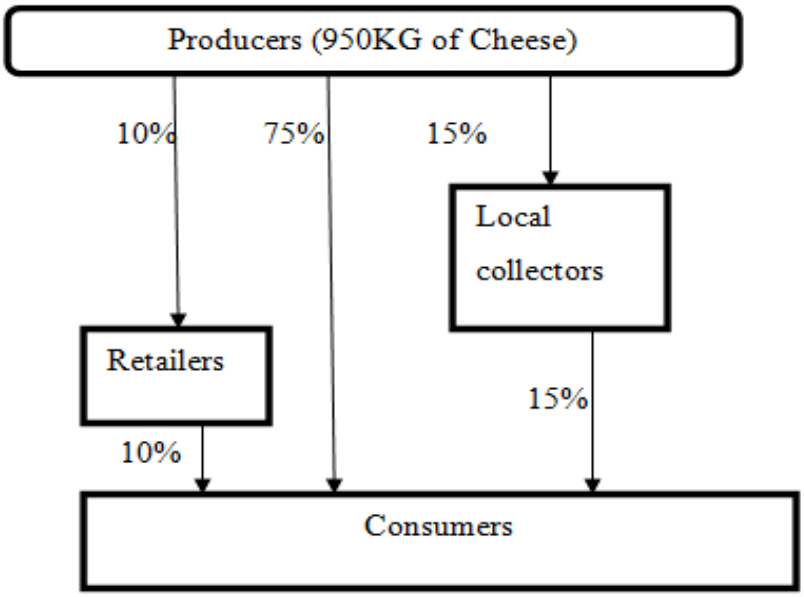

Figure 7: Cottage cheese marketing channel in study area

3.3 Cost and benefit distribution along dairy products value chain actors

Actors along dairy value chain participate in value addition to improve profitability. According to Armagan and Ozden (2010) most of the entrepreneurs aim at earning high profit and value in their dairy farms and add value to their dairy output in order to capture greater margins from the market. That is, through the analysis of margins and profits within the chain, one can determine who benefits from participation in the chain and which actors could benefit from increased support or organization. This is particularly important in the context of developing countries (agriculture in particular), given concerns that the poor in particular are vulnerable to the process of globalization (Kaplinsky and Morris, 2001). Moreover, analysis of dairy marketing channels allow to simplifying the complex nature of the subsector, helps to identify all key actors and the main leverage points for the sub-sector where targeted interventions could affect the entire value chain.

As the result indicated in Table 4, producers were incurred 49.20 ETB to produce one KG of butter from local and cross breed dairy cows averagely. Dairy cows management and product processing is labor intensive but producers have used family labor during production time, processing and marketing dairy products. The result revealed that the estimated cost of labor contribution in one KG of butter produced is 4 ETB. But the estimation of cost associated with owning dairy cows is difficult in study area because some of dairy cows born in home level and others purchased at calf stage from the market. The second reason is cost as well as benefit associated with owning dairy cows was not included along dairy products marketing chain. Therefore, including costs only associated with owning dairy cows without marketing dairy cows not benefit farmers. Thus, farmers distribute dairy products but they have left with dairy cows for further production. The result revealed that total share of marketing margin and share of profit margin of producer is 49.6% and 53.3% respectively. In further, wholesalers got highest marketing margin next to producers with the value of 22.6%. The share of profit margin of wholesalers, local collectors and retailers were 21.9%, 17.6%, and 7.2% respectively from the sales of 1 KG butter. This asserts that wholesalers are benefit more than other actors in marketing of dairy products along dairy value chain.

Table 4: An average butter marketing costs and benefit shares of actors

Items (Birr/KG)	Producers	Local collectors	Wholesalers	Retailers	Horizontal sum
Purchasing price	-	104.125	126.25	151.25	381.625
Production cost	49.20				19.20
Marketing cost					
• Rope	3.50	1.05	1.40	-	5.95
• Packaging material cost	-	2.5	2.10	0.85	1.05
• Transport cost	0.5	1.40	0.5	1.05	2.95
• Labor cost	-	0.35	0.08	-	0.43
Total cost	53.20	109.425	130.33	153.15	446.105
Revenue	104.125	126.25	151.25	160	541.625
Gross marketing margin	54.925	22.125	25	8.75	110.8
% Share of margin	49.6	20	22.6	8	100
Profit margin	50.925	16.825	20.92	6.85	95.52
% Share of profit	53.3	17.6	21.9	7.2	100

Source: Own survey result (2015)

Benefit distributed along dairy value chain varies from marketing channels in which products were distributed to actors. Thus, knowing different marketing channels realizes the transaction cost associated with channels and it helps the actors to choose the channel which may increase utilities and distribution efficiency. As the result indicated in Table 5 the total gross marketing margin (TGMM) is highest and lowest in channel V and II respectively.

The total marketing margin of producers (GMMf) in channel I is 100% implies that producers directly sold butter to consumers in better price and there are no intermediary actors in a channel. But these large gross marketing margins may not express high profit because cost associated with owning dairy cows, milking equipments, and land rent were implicit costs which are difficult and not known to estimate in study area at producers' level. GMMr is better in channel V indicates that they purchase butter on optimum price and sold to consumers for better price. This implies retailers in study area not incur marketing cost and benefits more in channel V than other channels. The NMMc is highest in channel V which is 17.8% and this implies that local collector sold butter directly to wholesalers make local collectors more profitable than selling in other channels.

Table 5: Benefit distribution of actors in different marketing channels of butter

Market margin	I	II	III	IV	V	VI	VII
TGMM	0	12	17.9	21	22.2	16	20
GMMf	100	88	82.1	79	78	84	80
GMMc	-	-	3.6	-	12.5	16	-
GMMw	-	-	14.3	14.10	-	-	20
GMMr	-	12	-	6.9	10	-	-
NMMF	96.7	12.8	22	11.9	6.2	12.3	8.5
NMMc	-	-	13.5	-	17.8	11.76	-
NMMw	-	-	11.4	17.9	-	-	17.3
NMMr	-	10.5	-	19.7	20.8	-	-

Source: Own survey result (2015)

As the result depicted in table 12, the profit margin of producers from on average 1Kg of cottage cheese marketing through three marketing channel is 18 ETB. This reveals that farmers got better profit margin than others. Local collectors and retailers have the profit share of 19.8 and 18.4 ETB respectively.

Table 6: An average cottage cheese marketing costs and benefit shares of actors

Items (Birr/KG)	Producers	Local collectors	Retailers	Horizontal sum
Purchasing price	-	50	60	110
Production cost	20	-	-	20
Marketing cost				
• Packaging material cost	4	1.5	-	5.5
• Transport cost	3	1.25	1.35	5.6
• Labor cost	5	1.5	2	7.5
Total cost	32	54.25	63.35	149.6
Revenue	50	60	68	178
Gross marketing margin	30	10	8	48
% Share of margin	62.5	20.8	16.7	100
Profit margin	18	5.75	5.35	29.1
% Share of profit	61.8	19.8	18.4	100

Source: Own survey result (2015)

3.4 Demographic Characteristics of Sample Households of Producers

Table 7 and 8 present the demographic and socio economic characteristics of the sample households. The total sample size of the producer households interviewed during the survey was 133. Out of 133 producer households, male and female households were 103 and 30 respectively. . From the result of survey data, the education level of the households 53.3%, 29.3%, 13.5%, 3.8% were illiterate, primary school and read and write, and high school respectively. This revealed that large percent of household were under illiterate with low perception for milk value addition. Average age of household head was 44.6 years; dominated by younger heads that encourage milk value addition participation decision of farmers. The maximum and minimum family size of the respondents was 10 and 3 respectively.

Thus, average family sizes of sample producers during survey were 6. In further, the result reveals that the major income source of the farmers are crop-livestock and crop production which accounts 99.2% and 0.8% respectively. An average land size of sample respondents is 1.1 ha per households in Essera District. Thus, the average numbers of milking cows per household is 2 in study area. Only 1.04 liters of milk, out of average 2.03 liters yield per day was used for value addition. The major milk value added products produced are butter and cottage cheese. About 71.4% of respondents revealed that they added values to milk in the form of butter and cheese where as the remaining 28.6% respondents consume milk in liquid form at household level. Thus, 28.6% of respondents are producing but not participate in milk value addition. On average 14.28 kg of butter was produced per household per year per cow and 9.68 kg of butter supplied to market from sampled households while on average 4.6 kg of butter was consumed at household level per year. The reason might be that they consume at home level because they have large number family size with dependent age group and they earn income from non dairy sources.

Table **7**: Socio economic data of producers in study area

Variables			Respondents 133**(100%)**	Mean value	Max	Min
Sex	Participants	Male	74	-	-	-
		Female	21	-	-	-
	Non participants	Male	29	-	-	-
		Female	9	-	-	-
Marital status	Single		-		-	-
	Married		96.2		-	-
	Divorced		2.3	-	-	-
	Widowed		1.5	-	-	-
Educational level	Illiterate		53.4			
	Read and write		13.5	-	-	-
	Primary school		29.3	-	-	-
	High school		3.8	-	-	-
Religion	Orthodox		65(48.9)	-	-	-
	Protestant		66(49.6)	-	-	-
	Cultural believes		2(1.5)	-	-	-
Main source of income	Crop production		0.8	-	-	-
	Crop + livestock production		99.2	-	-	-
Cooperatives	Yes		62(46.6)	-	-	-
	No		71(53.4)	-	-	-
Family size	-		133	6	10	3
Age	-		133	44.6	72	25
Land size	-		133	1.1	2	0.25
Off farm activities	Yes		133	100	-	-

Source: Own survey result (2015)

Table 8: The mean values and t-test results of independent continuous variables

Variables	Participants		Non participants		Total		
	Mean	Stad	Mean	Stad error	Mean	Stad error	t-value
Age	44.2 (1.1)	1.1	45.7	1.9	44.6	0.96	0.66
Education level	1.92	0.11	1.6	0.12	1.83	0.08	0.099*
Family size	5.7	0.17	5.4	0.26	5.6	0.14	-1.02
Land size	1.1	0.037	1.03	0.06	1.08	0.03	0.42
Distance nearest to market	11.7	0.6	10.98	1.13	11.54	0.54	-0.62
Milk yield produced per day per	2.14	0.082	1.72	0.05	1.93	0.07	0.00***
Number of dairy cows	2	0.9	1.5	0.35	1.75	0.6	0.05**
Dairy farming experience the household	10	6	7	3	8.5	4.5	0.82

Source: Own survey result (2015)

As the result indicated in Table 9 out of 133 respondents, 44% revealed that they have no experience of using inputs because access to extension service gap, limited supply of inputs, shortage of cash and costly to purchase. Thus, 56% of the respondents have experience in using inputs for dairy production. Farmers in study area get inputs from the source of GO and both GOs and agricultural growth program accounts 15% and 41% respectively. These inputs are cross breed cows and improved feed. Out of the sampled households, 34.6%, 27.1% of respondents revealed that the major means of getting inputs for dairy producers in study area are mainly through purchasing and both purchasing and gift respectively.

Table 9: Types, sources and means of getting inputs for dairy production in study area.

Inputs	Sources of inputs	Means of getting inputs						
	GOs (%)	Both GOs and AGP (%)	Credit (%)	Purchasing (%)	Gift	Purchasing and gift (%)	All (%)	
Dairy cows and feed	15	41.	13.3	34.6	14	27.1	10.5	

Source: Own survey result (2015)

As the result indicated in figure 8, the major source of income for producers in study area are sheep and goat, beekeeping, dairy, cereal crops and coffee and which accounts 8.3%, 12.5%, 16.7%, 29.2% and 33.3% respectively. Thus, on average farmers get 1000, 1500, 2000, 3500 and 4000 ETB from the sales of sheep and goat (Shoat), beekeeping, dairy, cereal crops and coffee. Therefore dairy sector is the third important for the contribution of income for producers in study area.

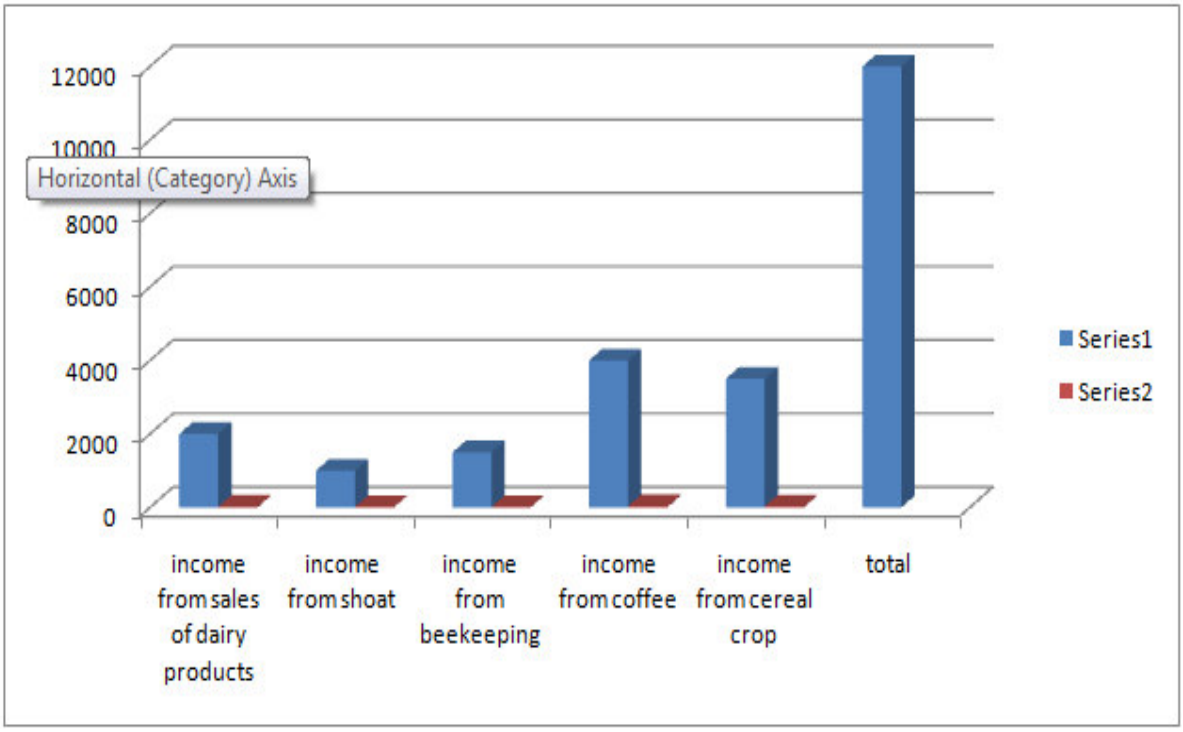

Figure 8: Income contribution of dairy sector compared to other sectors
Source: Own survey result (2015)

According to the result obtained from sample households in Table 11, producers' participation decision and level of participation on milk value addition was low because of shortage of extension service, limited access to credit, and limited access to market center and market information. In addition to these, milk value addition was not performed based on consumers' demand in study area. Out of sample households, 36% revealed that value added dairy products in market not meet the consumers' preference. Thus, in study area most of dairy producers add value on milk traditionally through indigenous knowledge. Still there is extension service gap on milk value addition in study area. Out of total sampled households, 51.9% revealed that there was a lack of extension service on milk value addition. According to the result obtained by the respondents' survey from the study area, the famers' participation decision on milk value addition constrained by accessing credit problem. As the result of survey of the sampled households, 66.2% and 33.8% are due to limited supply of credit and bureaucracy of the credit financing institute specially OMF respectively.

Table 10: Access to service and infrastructure to sampled households of producers (N=133)

Variables	Participants		Non participants		Chi2
	N (Yes)	%	N (Yes)	%	
Access to extension service	52	39	12	9	0.01
Access to credit	28	21	4	3	0.02
Access to market information	50	37.6	21	15.8	0.07
Access to market center	66	49.6	24	18	0.48
VA extends shelf life of the product	65	48.9	24	18	0.56
Membership of farmers cooperative	43	32	15	11	0.37
Access to milk collection center	10	8	2	1.5	0.34

Source: Own survey result (2015)

In addition to this, 100% of the respondents revealed that dairy products marketing were performed by women. The reason might be milk processing and dairy products marketing were culturally taboo for men. Majority of the farmers in study area add value on milk for the purpose of income generation and consumption. Mainly milk is processed and marketed by women and girls in study area. Respondents from the study area revealed that the reason they process milk is to fetch good price, both to fetch good price and to extend the shelf life of the products and to increase shelf life of the products which accounts 56.4%, 39.8% and 3.8% respectively. Dairy production is labor intensive and the result of respondent survey shows that 86.5% and 13.5% of labor source of the producers from dairy production to marketing performed by family labor and labor exchange respectively. In study area farmers have faced with the problem of infrastructure such as access to main road for market center and transport facility. Most of the time they use man power during marketing dairy products. Thus, 67.7% and 32.3% of transporting facility of the farmers are man power and vehicle respectively.

3.5 Demographic Characteristics of Sample Households of Traders

The major traders that market dairy products in study area are village collectors, wholesalers and retailers. Local collectors purchase dairy products from village and district market center from the hands of producers and marketing in district and zonal market center for wholesalers. In further, wholesalers were purchase the products from producers and local collectors thereby sold to retailers at Zonal level and wholesalers at out of Zonal level. Finally, consumers, hotels and cafeterias purchase from the hands of local collectors, wholesalers and retailers. Through the marketing channel the purchasing price and sales price distribution was different.

As the survey result indicated in Table 11, sample households of traders revealed that 87.5% of traders were females and the remaining 12.5% were males in study area. This indicates women play a great role in dairy products marketing in study area. On other hand, it is culturally taboo for men to market dairy products in study area. The average age of sampled traders was 32 years old and on average they participated on dairy products marketing for 4.25 years. This may indicate that they have good experience in dairy products marketing. Education level of the traders was important to create awareness for traders on dairy products value addition, market information, builds bargaining power and quality issues of the products which were marketed based on customers demand. The sampled traders' survey result realizes that the education level of traders in study area was poor. Thus, 54.2% of traders were illiterate implies that traders had poor know how on marketing dairy products based on customers preference.

Table 11: Socio economic data of traders in study area

Variables			Respondents 24(100%)	Mean value	Max	Min
Sex		Male	3 (12.5)	-	-	-
		Female	21 (87.5)			
Marital status	Single		4 (16.7)		-	-
	Married		12 (50)		-	-
	Divorced		6 (25)	-	-	-
	Widowed		2 (8.3)	-	-	-
Educational level	Illiterate		13 (54.2)			
	Primary school		11 (45.8)	-	-	-
Age	-		24 (100)	32	45	22
Family size	0		4 (16.7)	-	-	-
	Less than 5		9 (37.5)	-	-	-
	5-10 in numbers		11 (48.5)	-	-	-

Source: Own survey result (2015)

3.5.1. Source of Capitals for Traders along Dairy Value Chain in Study Area

Most of traders have been using their own capital and some have been using capitals in the form of loan from Omo Micro finance at the interest rate of 8% in study area. The survey result confirmed that 83%, 12.5% and 4.2% of the respondents had used their own capital, loan and both own and capitals from gift to run their business respectively.

3.5.2. Challenges Hindering Traders along Dairy Products Marketing

Traders in study area along dairy value chain faced with many problems. Respondents' survey result asserts that 33.3%, 29.2%, 20.8% and 16.7% were lack of training, lack of access to credit, lack of access to market and stiff competition of unlicensed traders respectively. The reason could be limited supply of credit and institutional weakness like license providing sectors. This creates illegal traders of dairy products in study area on legal traders thereby illegal traders were more beneficiary than legal ones.

Table 12: Socio economic and demographic characteristics of consumers

Variables		Respondents **12(100%)**
Sex	MHH	9 (75)
	FHH	3 (25)
Marital status	Single	3 (25)
	Married	9 (75)
Educational status	Illiterate	1 (8.3)
	Certificate	2 (16.7)
	Primary school	2 (16.7)
	High school	2 (16.7)
	Degree	2 (16.7)
Religion	Orthodox	5(41.7)
	Protestant	4 (33.3)
	Cultural believes	3 (25)
Main source of income	Farming	3 (25)
	Trader	3 (25)
	Employment	6 (75)
Age	19-64	9 (75)
	Above 64 years	3 (75)

Source: Own survey result (2015)

The result Table 12 indicates that the major income sources of consumers are trading, farming and an employment. Respondents revealed that both shortage of supply and quality standards low quality standard and supply shortage were the major problem hindering consumers purchasing power which accounts 41.7%, 33.3% and 25%, respectively. In Essera District 75% and 25% of sampled respondents allocated 10% and 15% of incomes to purchase dairy products per month respectively. Availability of dairy products in study area fluctuates from season to season. This implies throughout the year dairy products available but the volume of availability varies from season to season. The reason is in summer season there was availability of feeds for dairy cows which enhances milk yield and milk value addition performance. According to respondents survey 58% of the respondents have availability of dairy products at summer season.

Source: Own sketch from survey result (2015)

3.6 The Role of Gender in Dairy Value Chain at Producer Level

Gender division of labor is socially determined ideas and practices which define what roles and activities are considered as appropriate for women and men. Women are invisible and underserved suppliers and buyers in many agricultural value chains (Mayoux and Manfre, 2010). Gender framework analytical tool was used to identify the role of gender, access to and control over resources between men, women, women in membership of farmers' group and women not in membership of farmers' group to come with intervention areas. Men and women are involved in dairy sector in study area. Women are often involved in feeding, cleaning barn, watering, milking, processing and marketing of dairy products in study area. But in different ways; and they face different constraints. Women are most typically primarily in roles that revolve around the home, deferring matters of control of income, sales of dairy cows particularly access and control over resources. There are very few women member of and in leadership positions in cooperatives and unions in study areas.

Table 13: Dairy producers and their membership in farmers' group (N=133)

Members in farmers cooperatives		N	n	Percent
No	Women	30	18	60
	Men	103	56	54
Yes	Women	30	12	40
	Men	103	47	45.6

Source: Own survey result (2015)

Table 13 depicted above realizes the membership of dairy producers in cooperative groups. Thus, 'N' is the total sampled households and 'n' are the respondents who answered either 'yes' or 'no.' In study area male and female farmers belonging to farmer cooperatives are 45.6% and 40% respectively. Therefore, their internal economies of scale of producing large volume of dairy products on average input cost was low. In addition to this transportation facility shortage and lack of milk processing machine hinder the farmers' participation decision on milk value addition. This is because of farmers' in group have access to training on easy access to skills, credit and information which in turn enable them to improve milk value addition in farm level to get better price did single farmers. Mainly farmers in a group could produce more units of goods on average less input costs there by economies of scale was achieved.

Table 14: Distribution of dairy producers according to their roles (N=133)

Activities	Men (%)	Women (%)	Girls (%)	Boys (%)	Men and Women (%)	χ2-test
Feeding dairy cows	42.9	15	-	24.8	17.3	0.13
Watering	70.7	11.3	-	18		0.3
Barn cleaning	-	75.2	24.8	-	-	-
Cleaning milking container	-	79.7	9.8	10.5	-	-
Milk storing	-	83.5	16.5	-	-	-
Purchasing dairy cows	71.4	11.3	-	-	17.3	-
Milking	-	77.4	22.6	-	-	-
Milk processing	10.5	67.7	21.8	-	-	0.00***
Milk quality control	-	57.9	42.1	-	-	-
Packaging	-	75.9	24.1	-	-	-
Breeding	70.7	7.5	-	21.8	-	0.7
Health management	32.3	51.2	-	-	16.5	0.03**
Sales of dairy cows	81.2	13.5	-	-	5.3	0.00***
Marketing of dairy products	-	54.9	45.1	-	-	0.2

Source: Own survey result (2015)

Table 14 depicted above realizes that most of the activities in dairy value chain at farm level performed by women. Activities such as milk processing, health management and sales of dairy cows are statistically significant at the probability less than 1%. Most of the activities were performed daily, implying that dairy farming is a labor intensive sector. All gender contributed at least some role in most activities. However, there was disparity in level of labor contribution between men, women, boys and girls. In the study area, activities like barn cleaning, milking, cleaning milk container, milk storing, milk quality controlling, milk processing and marketing dairy products were performed by women mostly and girls by least. Mainly, processing of milk, barn cleaning, packaging of milk and milk products and milking were performed by women in study area. But breeding and sales of dairy cows were not familiar with women in study area. It has taken as culturally taboo to women to breeding dairy cows during heat period. This due to the activities was culturally taboo for men and women. The result agreed with Lane (1991), findings on dairy farming systems indicate that feeding, cleaning and milking of dairy animals are done mostly by women.

Table 15: Distribution of dairy producers according to access to resources (N=133)

Resources		Frequency	Percent
Land	Men	84	63.2
	Women	49	36.8
Credit	Men	103	77.4
	Women	30	22.6
Training	Men	92	69.2
	Women	41	30.8
Control over resource (Land, income, dairy cows	Men	113	85
	Women	20	15

Source: Own survey result (2015)

In fact dairy production including milk value addition highly needs access to resources for both men and

women. Thus, the result indicated in Table 16 realizes that control over resource was dominated by men in study area. The survey result of the respondents revealed that women perform different activities in study area but control over resource is dominated by men in men households. Women have limited to access to and control over resources like land, credit, dairy cows and income generated from dairy cows and dairy products. The respondents of female households revealed that the role of women along dairy value chain particularly in producer level is significant but access to and control over resource is unequally with men due to cultural taboo and both cultural taboo and lack of training which are influential factors; accounts 70% and 30% respectively. Findings from this study are also supported by FAO (2011) and IFAD (1999), which found that improvements in household food security and nutrition are associated with women's control over income and their inclusion in household decision making process on expenditures and other family issues.

In further, in study area women who are in farmers group have better to access to and control over credit, land, dairy cows and income generated from dairy cows, calves and dairy products than women who are not in farmers' group. In study area, women who are in farmers' group have supported from GOs and AGP (NGOs) as training, gift of dairy cows, dairy cows housing and improved feed. About 20% of respondents realize that access to and control over resources like credit was handled by women. This is because of lack of adult education and gap of extension service there by weaken milk value addition at farm level. The finding coincides with that of Sutter *et al*. (2009) found that uneducated and financially weaker women had low influence in joint decision making in the household. The result is also agreed with the study conducted by (Beth, 2001) who observed that women benefit most, when they have decision-making authority about the animals they manage and milk sales even without legal ownership rights. As the result indicated in figure 9, about 89.5% of sampled households revealed that milk processing mainly done by women.

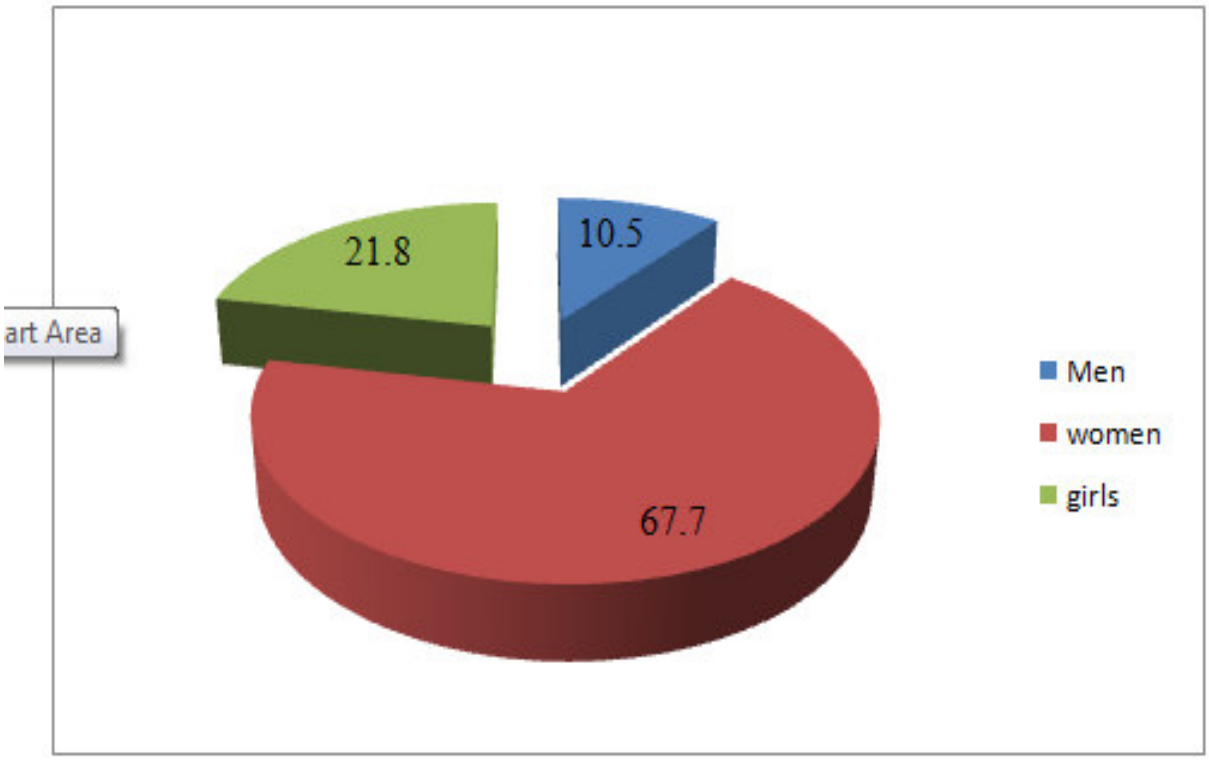

Figure 9: Milk-processing respect to gender in Essera District
Source: Own survey result (2015)

Table 1623: Influential factors of women in dairy value chain at farm level in Essera District

Influential factors	Frequency	Percent	Valid Percent	Cumulative Percent
lack of training	31	23.3	23.3	23.3
cultural taboo	59	44.4	44.4	67.7
lack of capital	23	17.3	17.3	85.0
lack of access to credit	20	15.0	15.0	100.0
Total	133	100.0	100.0	

Source: Own survey result (2015)

As the survey result indicated in table 16 realizes that lack of cultural taboo, lack of training, lack of

capital and lack of access to credit are the major factors that accounts 44.4%, 23.3%, 17.3% and 15% respectively there by hinder the role of women in dairy value chain in farm level in study area.

3.7 SWOT of Dairy Products Value Chain in Essera District

Dairy sector is the most important livestock subsector for smallholder dairy producers and traders in essera district. Farmers add value on milk and produce value added dairy products to generate income and consume at home level to alleviate poverty. But in Essera district the dairy sector faced with different challenges. Strength is internal attributes and resources that support a successful outcome in dairy sector. The finding of this result asserts that small holder dairy farmers have indigenous knowledge on dairy production and milk processing; availability of traditional churner, availability of labor, land ownership for grazing and cut and curry to feed their dairy cows and availability of water were the strengths which could enhance the dairy sector in study area.

Thus, weakness is internal attributes and resources that work against a successful outcome. the study of this result revealed that weak cooperation of actors, weak linkage of small holder dairy producers and traders of the study area with commercial actors; inadequate know how with regard to improved dairy production, products processing, cheese marketing, value addition, quality control, good hygiene and improved feeding of dairy cows; inadequate skills on the importance of farmers' cooperation and traders cooperation which hinders access to resources and control over resources were weakness along dairy value chain in study area. Finally farmers' were given strive on off farm activities and this weakness dairy sector Essera District. The survey result of this study realized that the opportunities are the external environment which was enhances dairy production from the concept of production design to the distribution of products to end consumers. These are demand of dairy products because of the presence of high schools, increase in income and health center there by population number increased; suitable nature of the district itself conducive for dairy cows implies that low outbreak of disease, presence of enough size of grazing land; governmental and nongovernmental organization encourages those who have interest to cooperate in common interest group by facilitating land access and training and absence of fluid milk collection center in study area enhance milk value addition of smallholder dairy producers; Possibilities improvement are available (Natural and genetic resources); there is political stability which makes favorable for dairy investment; and distribution into multiple market channels to reach more consumers the most important opportunities along dairy value chain in Essera District.

In further, find out threats faced with dairy sectors helps to take intervention areas. According to this study, the threats common with dairy sector in study area were; dairy farmers are resistant against improved dairy breeds' leads to shortage of milk for value addition; poorly developed dairy market infrastructure for collection and distribution of milk which was limits accessibility to market. Moreover, weak finance base of the small holder dairy farmers, per-urban dairy farmers and traders to invest on improvement and expansion their dairy enterprises. This is because of institutional weakness (bureaucracy, limited supply of credit, inputs and service) of credit and other supportive service providers. Finally, absence of regulations and rules on unlicensed dairy products traders which makes licensed traders less beneficiary from dairy sector. Generally, the major challenges along dairy value chain in study were identified and ranked in Table 19 as follows.

Table 19: Major challenges identified along dairy value chain in study area

Major challenges/constraints	Frequency	Percent	Rank
Lack of modern milk value addition experience	33	24.8	1
Poor milk and milk products storage facility	27	20.3	2
Shortage of improved feeds	5	3.8	8
Lack flow of information among actors	21	15.8	3
Attitudes towards non dairy farming	17	12.8	4
Lack of gender equality	7	5.3	7
Lack of dairy farmers cooperatives	13	9.8	5
Lack of formal marketing system	10	7.5	6

Source: Own survey result (2015)

4. SUMMARY, CONCLUSSION AND RECOMMENDATIONS

4.1. Summary and Conclusion

This study was aimed at analyzing value chain analysis of dairy products in Essera District Southern Ethiopia. The specific objectives of the study include identifying actors along dairy value chain and n and examining the performance of actors in the chain; analyzing the determinants of farmers' participation decision and level of participation on milk value addition, estimating cost and benefit distribution along dairy value chain and identifying the role of gender in dairy value chain in farm level. The data were generated from both primary and secondary sources. The primary data were collected from individual interview using pre-tested semi-structured questionnaire and checklist. The primary data for this study were collected from 133 randomly selected households

from Essera District, 24 traders from Bale, Dalli, Waka and Tercha town; and from 12 consumers. The analysis was made using descriptive statistics and econometric model using SPSS and STATA software

Based on the result obtained from survey data shows that 71.4% of the respondents participated in milk value addition and the remaining 28.6% of respondents are producing but not participate in milk value addition. They consume at home level in the form of fluid milk because of they have large number of family size with dependent age group and they earn income from non dairy sources. Only 1.04 liters of milk, out of average 2.03 liters yield per day, was used for value addition. From the result of survey data of respondents, the education level of the households 53.3%, 29.3%, 13.5%, 3.8% were illiterate, primary school and read and write, and high school respectively. This understands that large percent of household were under illiterate with low perception for milk value addition. Average age of household head was 44.6 years; dominated by younger heads that encourage milk value addition.

Farmers in study area get inputs from the source of GO and both GOs and agricultural growth program accounts 41% and 15% respectively. These inputs are cross breed cows and improved feed. The means of getting inputs are mainly through purchasing, both purchasing and gift. Most of the farmers in study area have no experience of using inputs for dairy production. Out of 133 respondents 44% revealed that they have no experience of using inputs because access to extension service gap, limited supply of inputs, shortage of cash and costly to purchase.

Respondents from the study area revealed that the reason they process milk is to fetch good price, both to fetch good price and to extend the shelf life of the products and to increase shelf life of the products which accounts 56.4%, 39.8% and 3.8% respectively. Dairy production is labor intensive and the result of respondent survey shows that 86.5% and 13.5% of labor source of the producers from dairy production to marketing performed by family labor and labor exchange respectively. The major traders which were playing dairy products marketing in study area were local collectors, wholesalers and retailers. Through the marketing channel the purchasing price and sales price distribution was different. The survey result of traders revealed that 87.5% of traders were females and the remaining 12.5% were males in study area. This indicates women play a great role in dairy products marketing in study area. On other hand, it is culturally taboo for men to market dairy products in study area.

The sampled traders' survey result realizes that the education level of traders in study area was poor. Thus, 54.2% of traders were illiterate implies that traders had poor know how on marketing dairy products based on customer oriented. Sampled respondents' survey result asserts that 33.3%, 29.2%, and 20.8% 16.7% were lack of training, lack of access to credit, lack of access to market and stiff competition of unlicensed traders respectively. The reason could be limited supply of credit and institutional weakness like license providing sectors. In study area the survey results out of 12 respondents of consumers, 66.7% of the respondents revealed that dairy products are not produced based on consumers' preference. The reason is lack of skills of dairy value chain actors on quality standards. Value chain governance was governed by some power full actors without formal coordination among the actors. Generally, in study area the traders who have no license of trading dairy products govern the traders who have license.

The share of profit margin of wholesalers, local collectors and retailers were 21.9%, 17.6% and 7.2% respectively from the sales of 1 KG butter. This asserts that wholesalers are benefit more than other actors in marketing of dairy products along dairy value chain. This asserts that wholesalers are benefit than other actors in marketing of dairy products along dairy value chain. Benefit distributed along dairy value chain varies from marketing channels in which products were distributed to actors. The total marketing margin of producers (GMMf) in channel I is 100% implies that producers directly sold butter to consumers in better price and there are no intermediary actors in a channel.

Women are most typically primarily in roles that revolve around the home, deferring matters of control of income, sales of dairy cows particularly access and control over resources. There are very few women member of and in leadership positions in cooperatives and unions in study areas. Activities like barn cleaning, milking, cleaning milk container, milk storing, milk quality controlling, milk processing and marketing dairy products were performed by women mostly and girls by least. This is due to the activities was culturally taboo for men.

4.2 Recommendations

Policy implications to be drawn from this study are based on the significant variables from the analysis of present study. Actors along dairy value chain have weak cooperation in study area. This results inadequate knowhow on milk value addition, information on price and weakens bargaining power of farmers and traders. Thus, actors have to encourage their cooperation to distribute value added quality dairy products. Most of the traders who have been participating dairy products marketing have no license in study area. This implies traders were experienced with traditional dairy marketing system along dairy value chain in study area. Therefore, the institutions which are responsible in license provision should implement the rules and regulation to benefit legal traders and encourage formal channel of butter and cheese marketing in study area. Mainly, policy makers should improve market infrastructure in study area. Farmers' internal economies of scale of producing large volume of dairy products on

average input cost was low in study area. In addition to this transportation facility shortage, poor access to credit and lack of milk processing machine hinder the farmers' participation decision on milk value addition. Therefore, all stakeholders should form farmers' interest group as cooperatives in dairy production. This is because of farmers' in group have access to training on credit and information which in turn enable them to improve milk value addition in farm level to get better price did single farmers. Value addition through both innovation and coordination should be improved to create economically new products based on consumers' preference. Through innovation the existing processes should be improved as well as the new product should be produced where as through coordination the cooperation among actors along dairy value chain should be created. Limited supply of credit and bureaucracy of financial institutions constrain actors to access to credit in study area. To overcome this problem, service providers like GOs and NGOs should provide inputs, credit, logistics and training for producers and traders that can enhance milk value addition and marketing. In addition to this, policy makers should strengthen financial institutions like Omo Micro Finance (OMF) to improve access to credit for farmers and traders to improve dairy sector in Essera District. Therefore, dairy value chain actors and policy makers should give strive for innovation and coordination among actors along dairy value chain to achieve the value addition activities in Essera District.
Women have crucial role in dairy value chain at farm level as well as along the chain. But women in study area have little access to and control over resources along dairy value chain. Empowering women have to the major task for the policy makers to encourage women access to and control over resources like land, credit, income, ownership of dairy cows and training by forming farmers' cooperatives. This can discourage influential factor like cultural taboo in Essera District. Therefore, targeting women for training and knowledge sharing along dairy value chains individually and in farmers' cooperative group can move women from subsistence to semi commercial producers there by encourage women access to and control over resources.

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